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AUTHOR Sturm, H. Pepper
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ABSTRACT

In 1989, the Nevada Legislature enacted the Class-Size Reduction (CSR) Act. The measure was designed to reduce the pupil-teacher ratio in the public schools, particularly in the earliest grades. The program was scheduled to proceed in several phases. The first step reduced the student-teacher ratio in selected kindergartens and first grade classes for 1990-1991 school years. The second step was designed to improve the second grade ratios; the 1991 Legislature made funds available for reducing the ratios to 16 to 1. The third grade phase was delayed until the 1996-97 fiscal year. Program costs are detailed, broken down by grade level, and the classroom configurations that have been employed are also described. Initial evaluation of the CSR program indicates that educators and parents were positive in their attitudes toward class-size reduction and that school districts reported fewer special education referrals. No exceptional results in achievement scores were reported. Subsequent studies of the program also produced mixed results, which it is believed reflect different teaching styles, maturity of students, and other factors. Special analysis of the program's impact on special-education referrals and grade retention are provided. (RJM)

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BACKGROUND PAPER 97-7

NEVADA'S CLASS-SIZE REDUCTION PROGRAM

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BACKGROUND PAPER 97-7

NEVADA'S CLASS-SIZE REDUCTION PROGRAM

Nevada Revised Statutes 388.700 —388.730
"PROGRAM TO REDUCE THE PUPIL-TEACHER RATIO"

H. PEPPER STURM, COMMITTEE POLICY ANALYST
SENATE HUMAN RESOURCES COMMITTEE
NEVADA LEGISLATIVE COUNSEL BUREAU
MARCH 1997

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SELECTED DATA
NEVADA CLASS-SIZE REDUCTION PROGRAM

Prepared by
Pepper Sturm, Policy Analyst
Senate Committee on Human Resources

PROGRAM INFORMATION

Following a review of the topic by a 1988 interim legislative study, the 1989 Nevada Legislature enacted the Class-Size Reduction Act (CSRA). The measure was designed to reduce the pupil-teacher ratio in the public schools, particularly in the earliest grades and in classrooms where the core curriculum is taught.

The program was scheduled to proceed in several phases. The first step reduced the ratio in selected kindergartens and first grade for the 1990-1991 school year. The following phase was designed to improve second grade ratios, followed by third grade reductions and broadening kindergarten assistance. The 1991 Legislature made funds available for the 1991-1992 school year to reduce the ratios in first and second grades and selected kindergartens at the 16 to 1 ratio. Due to budget shortfalls late in 1991 and continuing state fiscal needs, the third grade phase was delayed until the 1996-1997 fiscal year when partial funding was provided.

After achieving the target ratio of 15 pupils to one teacher in the primary grades, the program proposes the pupil-teacher ratio be reduced to 22 pupils per class in grades 4, 5, and 6, followed by a reduction to no more than 25 pupils per class in grades 7 to 12.

Pupil-Teacher Ratios

The charts below display the actual pupil-teacher ratios in the CSR target grades during the lifetime of the program. Note that the actual ratios fluctuate from year to year, reflecting

PUPIL-TEACHER RATIOS IN NEVADA SCHOOLS
KINDERGARTEN THROUGH 3RD GRADE
1989-1990 THROUGH 1996-1997 SCHOOL YEARS

	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97
Kindrgrtn	21.5	22.9	22.9	22.4	23.3	23.5	24.6	23.4
1st Grade	25.4	16.1[1]	15.6	15.8	16.0	15.9	16.2	16.1
2nd Grade	25.9	25.6	16.3[2]	15.6	16.1	15.9	16.2	16.0
3rd Grade	27.1	27.0	28.1	27.0[3]	25.5	26.6[3]	27.2[3]	22.6

[1] Class-size reduction began in first grade and selected at-risk kindergartens in school year 1990-1991.
[2] Class-size reduction program was expanded to include second grade in school year 1991-1992.
[3] Expenditures of class-size reduction funds by Nevada's school districts for third grade in the 1992-1993 school year were canceled at the request of Governor Bob Miller. Funding to extend the program into third grade in 1993-1994 was not provided by the 1993 Legislature, however the 1995 Legislature provided $7.3 million to begin third grade reductions in the 1996 -1997 school year. Third grade class size money may also be used to fund approved programs to improve pupil achievement.
(Note: Shading indicates significant funding for CSR program)
Source: Nevada's State Department of Education and Fiscal Analysis Division, Legislative Counsel Bureau, 1997.

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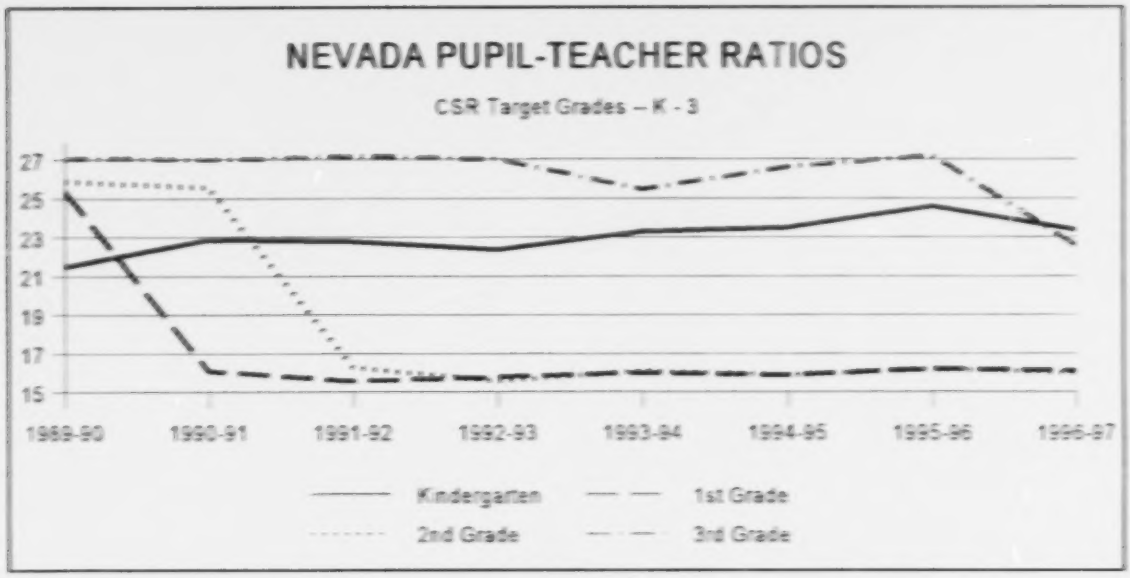
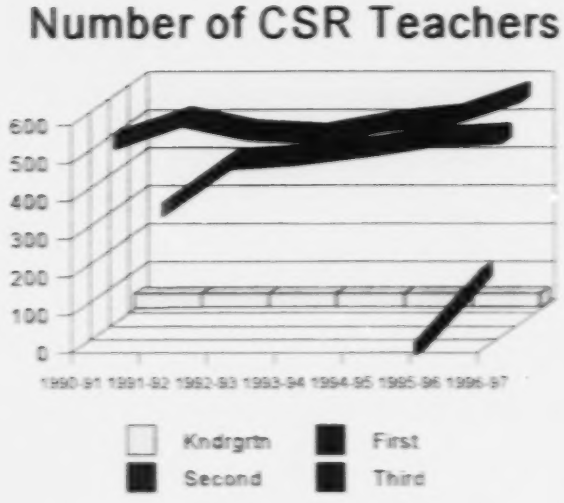


the success in projecting student growth and the number of teachers needed for the program. The actual funding allocation for Nevada's Class-Size Reduction Program is calculated by projecting student growth, figuring in the number of teachers districts would have hired to keep pace with that growth under the old ratios, then calculating the number of additional teachers needed to reduce the pupil-to-teacher ratio to the funded level (currently 16 to 1). The CSR appropriations bill specifies the numbers of teachers to be hired, by grade. The measure also specifies the amount of the appropriation, by grade, based upon that estimated number of teachers multiplied by actual average of new hire salaries and benefits. In the current fiscal year, Nevada has employed 1,342 CSR teachers. The growth in the numbers of these teachers reflected on the chart at the left side of the page is a function of student growth in existing CSR grades, plus the addition of other grades as the program was phased in.



	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97
Kndrgrtn	23	23.5	23.5	23.5	23.5	23.5	23.5
First	475.5	534.5	498.5	489.5	521.5	539.5	599
Second	-	332.5	458.5	468	489	517	524.5
Third	-	-	-	-	-	0	195

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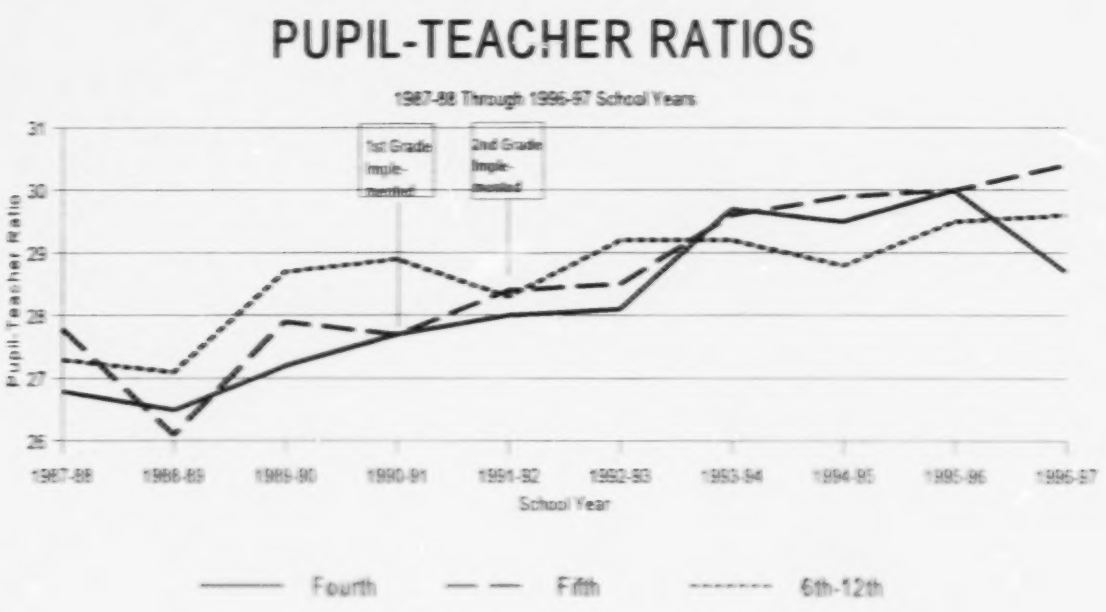
Effect Upon Pupil-Teacher Ratios in Other Grades

Recently, concerns have been raised by policymakers about the effect of the CSR program on grades other than the targeted primary grades. The following graph illustrates the changes in pupil teacher ratios in the grades immediately above the target class-size reduction grades.



	87-88	88-89	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97
Fourth		26.8	26.5	27.2	27.7	28	28.1	29.7	29.5	30	28.7
Fifth		27.8	26.1	27.9	27.7	28.4	28.5	29.6	29.9	30	30.4
6th-12th		27.3	27.1	28.7	28.9	28.3	29.2	29.2	28.8	29.5	29.6

Prepared by the Research Division, Legislative Counsel Bureau, from data supplied by the State Department of Education, March 1997.

When ratios for fourth and fifth grades are reviewed, a definite increase can be seen across time as the CSR program was implemented in the primary grades. Although additional analysis would be needed to identify any **direct** correlation, it appears from the data that the ratios in the upper grades have increased when new CSR grades have been funded. If the *Executive Budget* which includes full funding for third grade in the second year of the biennium is approved, it would be prudent to monitor the pupil-teacher ratios in fourth and fifth grades.

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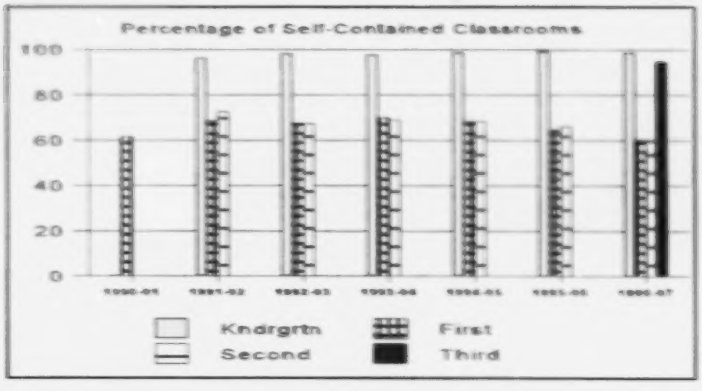
The next chart displays the actual cost of Nevada's CSR program over time. Note that the program costs increase as new grades are phased into the program. By the end of this fiscal year,

**YEARLY EXPENDITURES (IN THOUSANDS)
FOR CLASS-SIZE REDUCTION PROGRAM
KINDERGARTEN THROUGH 3RD GRADE
(1990-1991 THROUGH 1996-1997 SCHOOL YEARS)**

	1990-91	1991-92*	1992-93*	1993-94*	1994-95*	1995-96*	1996-97†
Kindergarten	$ 746.9	$ 792.8	$ 820.1	$ 853.7	$ 876.0	$ 945.4	$ 991.7
1st Grade	15,266.5	18,030.8	17,396.5	17,746.0	19,439.3	21,703.2	25,278.7
2nd Grade	--	11,216.6	16,000.6	16,928.6	18,227.8	20,798.1	22,134.7
3rd Grade**	--	--	--	--	--	--	7,308.4
TOTAL	$16,013.4	$30,040.2	$34,217.2	$35,528.3	$38,543.1	$43,446.6	$55,713.5

*In 1990-1991, expenditures for at-risk kindergartens were tracked separately from expenditures for first grade. Since then, however, the class-size reduction funds for all grades have been combined. The amounts reportedly spent in each grade in succeeding years represent a proportional share of expenditures based upon the number of class-size reduction teachers employed for each grade.
**Expenditures of class-size reduction funds by Nevada's school districts for third grade in the 1992-1993 school year were delayed at the request of Governor Miller. Funding to extend the program into third grade in 1993-1994 was not provided by the 1993 Legislature, however the 1995 Legislature provided $7.3 million to begin third grade reductions in the 1996-1997 school year. Third grade class size money may also be used to fund approved programs to improve pupil achievement.
†Estimated (breakout by grade based upon 2-year average percent of total); rounding may affect total.
Source: Nevada's State Department of Education and Fiscal Analysis Division, Legislative Counsel Bureau, 1997.

Nevada will have expended approximately $254.2 million for the direct costs of funding CSR, excluding any local capital expenditures or other local costs. In the coming biennium, the *Executive Budget* is recommending full funding for third grade; with that addition, the biennial expenditure for the CSR program is expected to be approximately $155 million, or about $25.6 million per grade per year (excluding kindergarten). The Legislature is currently reviewing this budget item but has yet to act upon these recommendations.



Classroom Configuration

The percentage of "self-contained" first and second grade classrooms (where one teacher is alone in the room with the students), has declined over each of the last four years, and the percentage of team-taught classes has increased. In school year (SY) 1996-1997, about 60 percent of all first grade classrooms were self contained, down from 65 percent the previous school year. Second grade self-contained classrooms made up 60 percent of the total in SY 1996-1997, down from 66 percent from the previous school year. Most of the third grade classrooms are self-contained, as are nearly all kindergarten classes. With the higher pupil-teacher ratios in those classrooms, team-teaching has not been an option. However, with the addition of full funding for third grade class-size reduction, it is likely that the percentage of self-contained third grade classrooms will decline.

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EVALUATIONS OF NEVADA'S CLASS SIZE PROGRAM

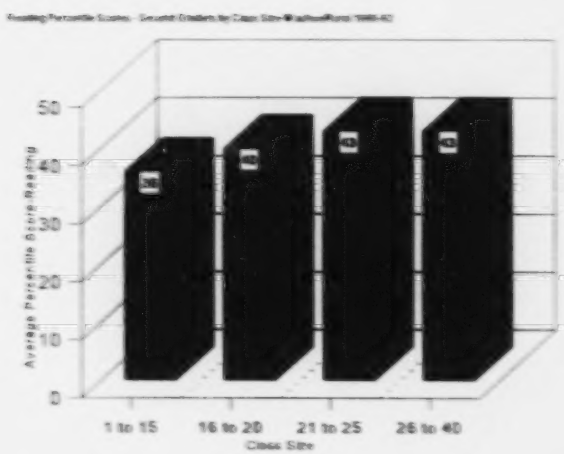
There have been two formal reports to date, with another expected in April 1997.

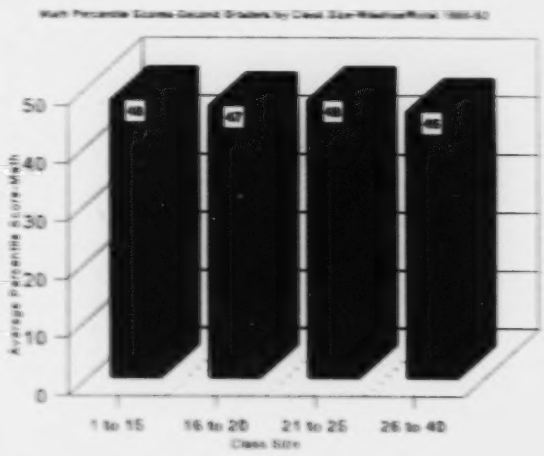
1993 Evaluation Report

In 1993, Nevada's State Department of Education's report on the CSR program makes the following conclusions:

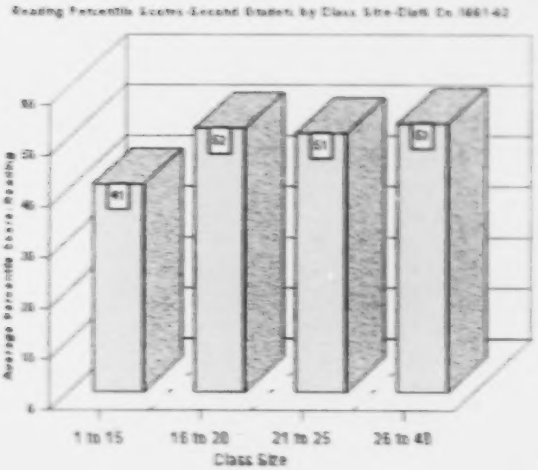
- Principals, teachers, and parents were very positive in their attitudes toward class-size reduction, and the dynamics created within the classroom contributed to an improved learning environment;
- School districts reported fewer special education referrals (a decrease of 5 percent); and less teacher absenteeism (a decline of 7.1 percent); and
- Achievement data did not produce exceptional results, except among certain subgroups.

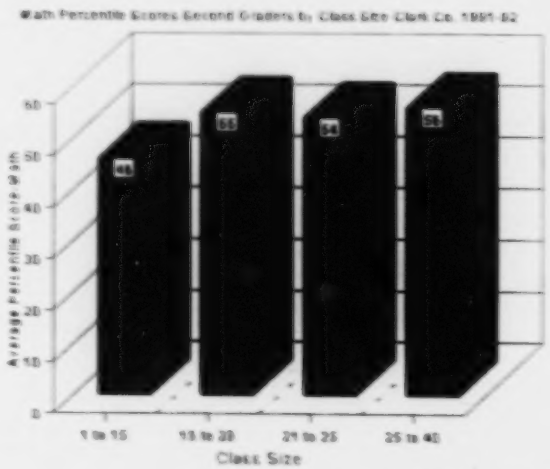
Washoe and Rural Districts





Clark County School District





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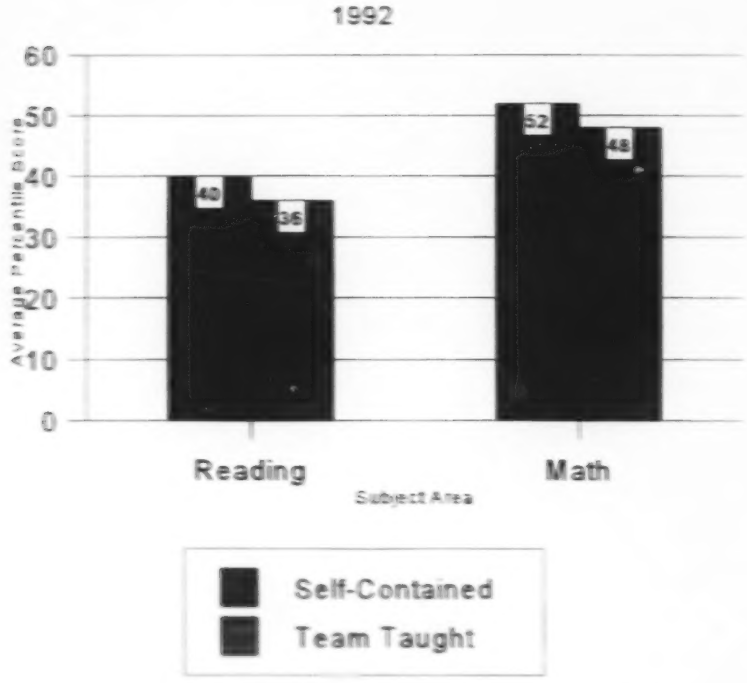
Reading and Math Percentile Scores of Second Grade Students by Class Configuration — Washoe and Rural School Districts



According to the 1993 evaluation report, overall for the Washoe-Rural students there was a reliable and small difference in mean reading and math scores in favor of the self-contained classrooms. However, the difference was not large enough to be considered significant.

Possible Data Problems

- The Clark County School District, accounting for almost 65 percent of the state's students, tested in the Fall; all others tested in the Spring;
- The first year of the program was also the first year of the new CTBS/4 test; scores are typically lower the first year of a new assessment;
- There was no real control group; and
- Anecdotally, team teaching may be taking place in the higher growth (usually higher income) areas, while self-contained classrooms remain in older, less affluent areas.

The study concluded that more study was needed and that, "There is much that is not known about how low student-teacher ratios can be used to greatest advantage."

1995 Evaluation Report

The 1995 evaluation report, released in February 1995, also produced mixed results, with some students scoring higher in mathematics but lower in reading; these results were reversed for other groups. As with the 1993 results, academic gains appeared to be more predictable based upon student socioeconomic status rather than upon class size. The report concludes:

- Second grade reading scores tended to be lower in smaller (1-15) classrooms than in larger (over 15 students), while mathematics scores tended to be higher in smaller classrooms.

- When looking at third grade students who had attended Nevada schools in the second grade versus students who did not, the graduates of the State's second grades scored significantly higher in both reading and mathematics.

Third Grade Scores by Attendance in Second Grade

Reading	1993 Score	1993 Percentile	1994 Score	1994 Percentile	Clark 1993 Score	Clark 1993 Percentile
Attended Nevada 2nd Grade	680	50	682	52	673	43
Attended Other 2nd Grade	674	45	670	42		
Could Not Determine	652	29	654	30	670	41
p	<.01*		<.01*		.02*	
Mathematics	**Score**	**Percentile**	**Score**	**Percentile**	**Score**	**Percentile**
Attended Nevada 2nd Grade	674	49	675	50	670	52
Attended Other 2nd Grade	666	43	666	43		
Could Not Determine	644	26	658	36	667	49
p	<.01*		<.01*		.02*	

*This difference is significant

Finding: ***Students who attended Nevada schools during the first grade had significantly higher second grade reading and mathematics scores than did students who did not attend first grade in Nevada or for whom first grade attendance could not be determined by the teacher.***

Second graders who attended Nevada schools in first grade did better than those who did not. The scores are significantly higher except for the mathematics scores in 1993.

Second Grade Scores by Attendance in First Grade

Reading	1993 Score	1993 Percentile	1994 Score	1994 Percentile
Attended Nevada 1st Grade	643	45	639	41
Attended Other 1st Grade	637	40	627	33
p	.04*		<.01*	
Mathematics	**Score**	**Percentile**	**Score**	**Percentile**
Attended Nevada 1st Grade	623	55	621	54
Attended Other 1st Grade	619	53	613	48
p	.09		.01*	

*This difference is significant

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- A gains analysis comparing test score gains for the same students as they moved from second to third and to fourth grade did not show significant differences by the class-size ratio experienced in second grade with one general exception — mathematics scores were higher for the Washoe County and rural students (tested in the Spring) in larger classes (greater than 15 to 1).

Gains from second grade through the fourth grade (from 1992 through 1994) were compared for rural and Washoe students. These gains were not significant.

Fourth Grade Gains of Students by Second Grade Class Size	
Reading Gains	1992-1994
1-15 Students Over 15 Students *p*	37 32 .32
Mathematics	1992-1994
1-15 Students Over 15 Students *p*	18 19 .51

The actual scores of these students were examined over the two-year period.

Finding: ***The mathematics and reading scores were higher for third graders who attended second grade in large classrooms than for those who attended second grade in small classrooms.***

Third Grade Scores by Second Grade Class Size						
Reading	1993		1994		Clark 1994	
	Score	Percentile	Score	Percentile	Score	Percentile
1-15 Students	679	49	681	51	677	47
Over 15 Students	685	54	688	57	675	45
p	*<.01**		*<.01**		.75	
Mathematics	Score	Percentile	Score	Percentile	Score	Percentile
1-15 Students	673	49	676	51	672	54
Over 15 Students	678	53	682	56	672	54
p	*>.01**		*<.01**		.96	

*This difference is significant

- There was a tendency for greater gains in mathematics to be associated with larger second grade classrooms, and greater gains in reading associated with smaller second grade classrooms.

- There are several factors overwhelmingly more important in predicating pupil achievement scores--special education status; ESL status, ethnicity, free lunch eligibility, and class configuration (in descending order), each accounted for more variance in scores than did class size.

- Approximately 90 percent of the differences in student scores are "unexplained" by the data. These differences reflect such factors as different teaching styles, maturity of students, family support, and other variables not included in the study.

Low SES Third Grade Scores by Nevada Second Grade Attendance						
Reading	1993 Score	1993 Percentile	1994 Score	1994 Percentile	Clark 1994 Score	Clark 1994 Percentile
Attended Nevada 2nd Grade	661	35	661	35	651	27
Attended Other 2nd Grade	665	38	652	29		
Could Not Determine	638	21	643	23	655	30
p	< .01*		.10		.07	
Mathematics	Score	Percentile	Score	Percentile	Score	Percentile
Attended Nevada 2nd Grade	657	35	654	33	650	32
Attended Other 2nd Grade	653	32	646	27		
Could Not Determine	629	17	648	28	653	35
p	.02*		.11		.14	

*This difference is significant.

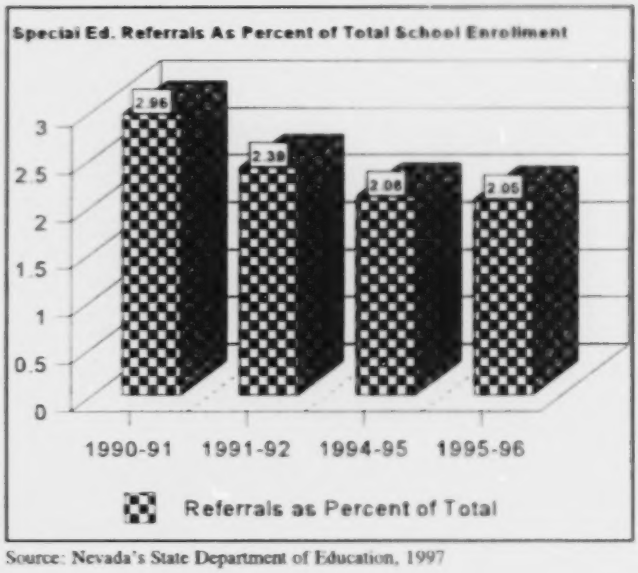
Finding: ***In 1993 third grade rural and Washoe students who were eligible for free or reduced cost lunch scored higher in mathematics but lower in reading if they attended Nevada schools in second grade. There were no significant differences in 1994 in any districts.***

Role of Class Size in Student Scores		
Reading	1993	1994
Percentage of Reading Scores Explained by Class Size	0.1	0.2
Percentage of Reading Scores Explained by Student Characteristics	10.5	10.5
Mathematics		
Percentage of Mathematics Scores Explained by Class Size	3.4	0
Percentage of Mathematics Scores Explained by Student Characteristics	7.4	8.2

CURRENT EVALUATION DATA

Special Education Referrals

The following chart displays the total statewide special education referrals for all ages and grades



Source: Nevada's State Department of Education, 1997

Note that the data is not separated by grade or by whether the pupil was part of the Federal program to identify children with disabilities beginning at ages 3 and 4.

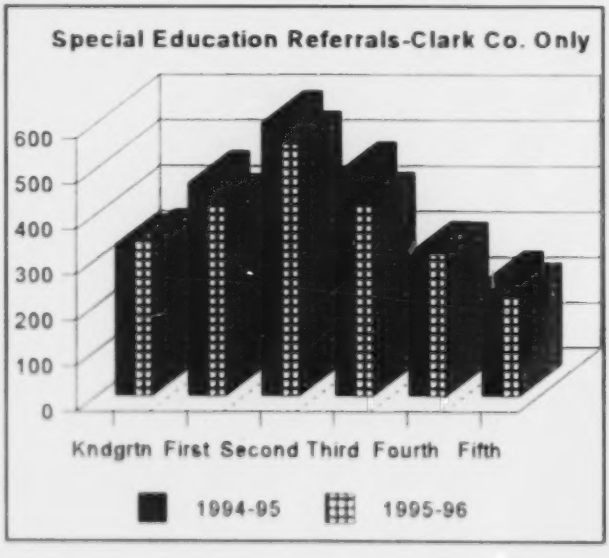
The data was presented as follows:

	1990-91	*1991-92*	*1994-95*	*1995-96*
No. Referrals	5,972	5,076	5,223	5,445
Total Enrollment	201,316	211,810	250,747	265,041
Referrals As a % of Total	2.96	2.39	2.08	2.05

Next, Nevada's largest district, Clark County School District, was asked to provide special education referral information for the past two school years, by grade. Unlike the previous figure, this chart includes data that has not been adjusted for growth. The declines of referrals in the class-size grades, (grades 1 and 2), are all the more dramatic due to the high growth in the primary grades over that same time period.

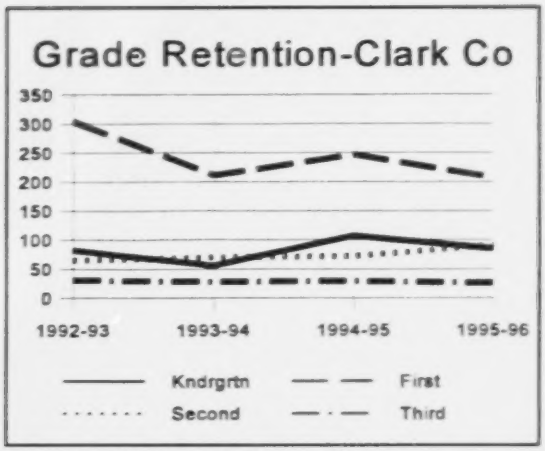
	Kndgrtn	First	Second	Third	Fourth	Fifth
1994-95	328	467	600	488	313	249
1995-96	340	417	554	420	312	222

Again, the Clark County School District advises caution in interpreting these results. Early identification of some individuals prior to kindergarten may skew this data.



Grade Retention

The Clark County School District also reviewed its records concerning grade retention in the primary grades. Again, these numbers have not been adjusted for growth. The chart to the left shows a decline in first grade retentions. Retentions in the second grade have remained essentially flat or increased slightly over time. The data used to compile the chart follows:



Source: Clark County School District, 1997

	1992-93	1993-94	1994-95	1995-96
Kndgrtn	82	56	10	85
First	304	211	247	207
Second	65	70	72	91
Third	31	28	29	26

Since there was no formal statistical analysis of this data, especially with respect to class size students versus growth (new) students, caution should be used in attributing any changes to the Class-Size Reduction Program.

1995-1996 Nevada Class Size Survey Results

Although the final report for 1997 is still being prepared, the survey component has been completed. Among the findings from this segment of the report are the following:

- Class-size reduction continues to receive positive support statewide from principals, teachers, and parents.
- Most respondents feel that having a smaller class means that each child will receive the individual attention needed to fully understand the skills that are being taught.

SURVEY RESPONSE CONCERNING PERCEIVED EFFECT OF NEVADA CLASS-SIZE REDUCTION PROGRAM ON TEACHING AND LEARNING 1995-1996

	Percent Reporting Some or Great Improvement	Percent Reporting No Change	Percent Reporting a Decline
Principals	74	16	3
Teachers	74	17	5
Parents	74	22	4

Note: Responses listed do not include those who left these questions blank.

Source: *1995-96 Class-Size Reduction Survey Results for Nevada*, Statewide Results Prepared by the Clark County School District, 1996.

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- Even though many respondents stated that team teaching is preferable to 30 to 1 ratios, they believe it is not as beneficial as each teacher having a self-contained classroom of 15 to 1.

- Fully one-third of parents did not respond to questions assessing the impact of CSR upon their child, and concerning the importance of third grade class-size reductions.

1995-1996 SURVEY RESPONSE: TOP TWO COMMENTS CONCERNING NEVADA'S CLASS-SIZE REDUCTION PROGRAM

	What Is Most Advantageous Aspect (Or What Effect on Child)?	What Aspect Interferes with Success (Or What Problems as it Affects Your Child)?
Principals	- More one on one and small group instruction/interaction	- Lack of space/classrooms - Team teaching
Teachers	- More one on one and small group instruction - Team teachers can share ideas and learn from each other	- Lack of space/classrooms - Team teaching
Parents	- Teacher can give child more individual attention - Students feel more confident and have higher self esteem in a small class	- There are no problems - Team taught classrooms overcrowded and noisy

Source: *1995-96 Class-Size Reduction Survey Results for Nevada*, Statewide Results Prepared by the Clark County School District, 1996.

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